

WHAT IS CLAIMED IS:

1 1. A data communication apparatus for performing data
2 communication with a partner apparatus through a
3 communication line, said data communication apparatus
4 comprising:

5 job execution means for receiving data from the
6 partner apparatus, for executing a job; and

7 job management means for managing an execution
8 status of said job;

9 wherein:

10 when a job whose execution was interrupted by a
11 given event is to be resumed, said job management means
12 instructs said job execution means to resume the job, while
13 presenting an execution status at a time when the execution
14 of the job was interrupted; and

15 said job execution means refers to the execution
16 status at the time when the execution of the job was
17 interrupted, for receiving only data required for executing
18 a non-processed part of the job, said execution status
19 being presented by said job management means, relating to
20 the job about which the instruction of resuming has been
21 given.

1 2. ~~The data communication apparatus according to Claim~~
2 1, wherein:

3 said data communication apparatus performs
4 communication with the partner apparatus through a serial
5 interface based on IEEE (The Institute of Electrical and
6 Electronics Engineers, Inc.) 1394 and in accordance with a
7 data transfer protocol based on SBP-2 (Serial Bus Protocol
8 2);

9 said job execution means follows ORB (Operation
10 Request Block), which is received from the partner
11 apparatus as a job and contains data indicating a storage
12 area of data to be transferred from said partner apparatus
13 to said data communication apparatus, in order to generate
14 and send Read Block Request that indicates a read start
15 address and a predetermined read data quantity to the
16 partner apparatus, and receives, in response, Read Block
17 Response that contains read data, so that the job execution
18 means sequentially reads the data by the predetermined data
19 quantity from any address, so as to receive the data in the
20 storage area indicated by said ORB; and

21 when said job management means instructs said job
22 execution means to resume execution of the ORB whose
23 execution was interrupted by a given event, then, the job
24 execution means refers to the execution status presented
25 from said job management means relating to the time when
26 the execution of said ORB was interrupted, in order to
27 generate Read Block Requests required for receiving data
28 that has not been obtained yet, excluding data that has

29 ~~already obtained, out of the data in the storage area~~
30 indicated in said ORB, to send said Read Block Requests to
31 the partner apparatus, and to receive Read Block Responses
32 as responses to said Read Block Requests.

1 3. The data communication apparatus according to Claim
2 2, wherein:

3 said data communication apparatus further comprises
4 bus reset detection means for detecting a bus reset defined
5 by IEEE1394, as said given event;

6 said job management means comprises:

7 means for managing the execution status of said ORB
8 by knowing ORB under execution by said job execution means
9 and at least one of: a number of sending Read Block
10 Requests generated to execute said ORB, a number of
11 receiving Read Block Responses received from the partner
12 apparatus as responses to said Read Block Requests, and a
13 total byte number of read data contained in said Read Block
14 Responses; and

15 instruction means for giving instruction to said job
16 execution means to resume the execution of said ORB when a
17 reconnection process defined by SBP-2 is requested from the
18 partner apparatus that sent the ORB whose execution was
19 interrupted by a bus reset detected by said bus reset
20 detection means and, thereafter, a same ORB as said
21 interrupted ORB is sent again, said instruction being given

22 ~~by presenting at least one of: a number of sending Read~~
23 Block Requests, a number of receiving Read Block Requests,
24 and a total byte number of received data contained in said
25 Read Block Responses, at the time when the execution of
26 said ORB was interrupted; and

27 when said job management means gives instruction of
28 resuming said ORB, said job execution means generates Read
29 Block Requests required for receiving the data that has not
30 been obtained yet, excluding the data that has already
31 obtained, out of the data in the storage area indicated in
32 said ORB, specifying said data that has not been obtained
33 yet by at least one of: the number of sending Read Block
34 Requests, the number of receiving Read Block Responses, and
35 the total byte number of the received data contained in
36 said Read Block Responses, at the time when the execution
37 of said ORB was interrupted, those numbers being presented
38 by said job management means; and said job execution means
39 sends the generated Read Block Requests to the partner
40 apparatus, and receives Read Block Responses in response.

1 4. The data communication apparatus according to Claim
2 3, wherein:

3 said data communication apparatus further comprises
4 a buffer for storing data contained in Read Block Response
5 corresponding to Read Block Request for executing the ORB
6 received by said job execution means; and

7 ~~data stored in said buffer is not cleared even when~~
8 a bus reset is detected by said bus reset detection means.

1 5. The data communication apparatus according to Claim
2 4, further comprising:

3 reset means that clears the data stored in said
4 buffer, when a request of said reconnection process is not
5 received within a predetermined period from the partner
6 apparatus that sent the ORB whose execution was interrupted
7 by a bus reset, after said bus reset is detected by said
8 bus reset detection means.

1 6. The data communication apparatus according to Claim
2 5, wherein:

3 a size of the data contained in Read Block Response
4 corresponding to Read Block Request for executing the ORB
5 received by said job execution means is smaller than a size
6 of said buffer.

1 7. The data communication apparatus according to Claim
2 5, wherein:

3 said job execution means sends the partner apparatus
4 Read Block Request generated for executing said ORB after a
5 free capacity of said buffer becomes larger than the read
6 data quantity indicated in said Read Block Request.

1 8. A printer provided with the data communication

2 apparatus according to Claim 5, wherein:

3, ~~said buffer sends~~ the stored data to a printer main

4 ~~part by the byte.~~

